



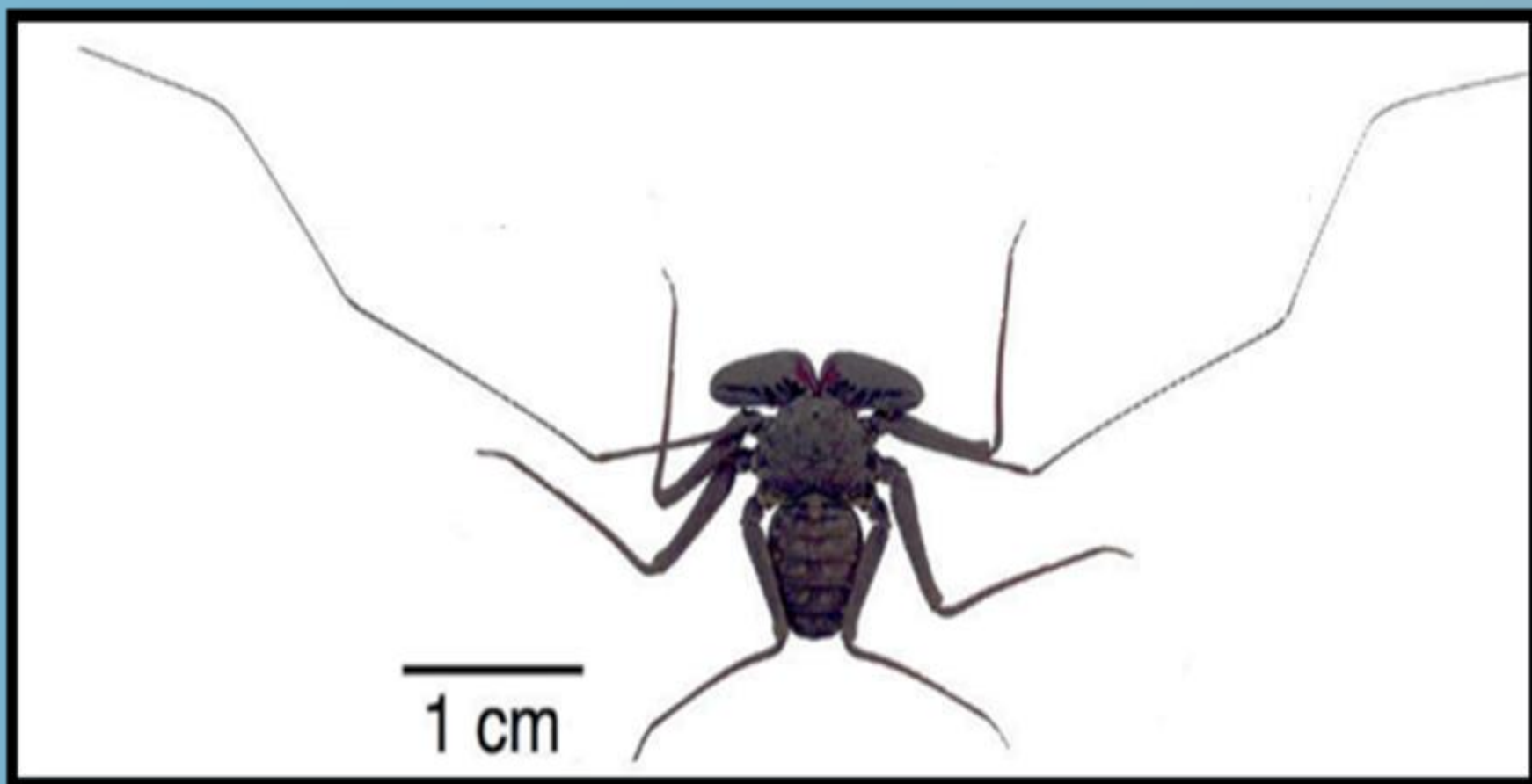
# Serotonin Disruption Leads to Memory Deficits in the Whip Spider *Phrynos marginemaculatus*



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## Introduction



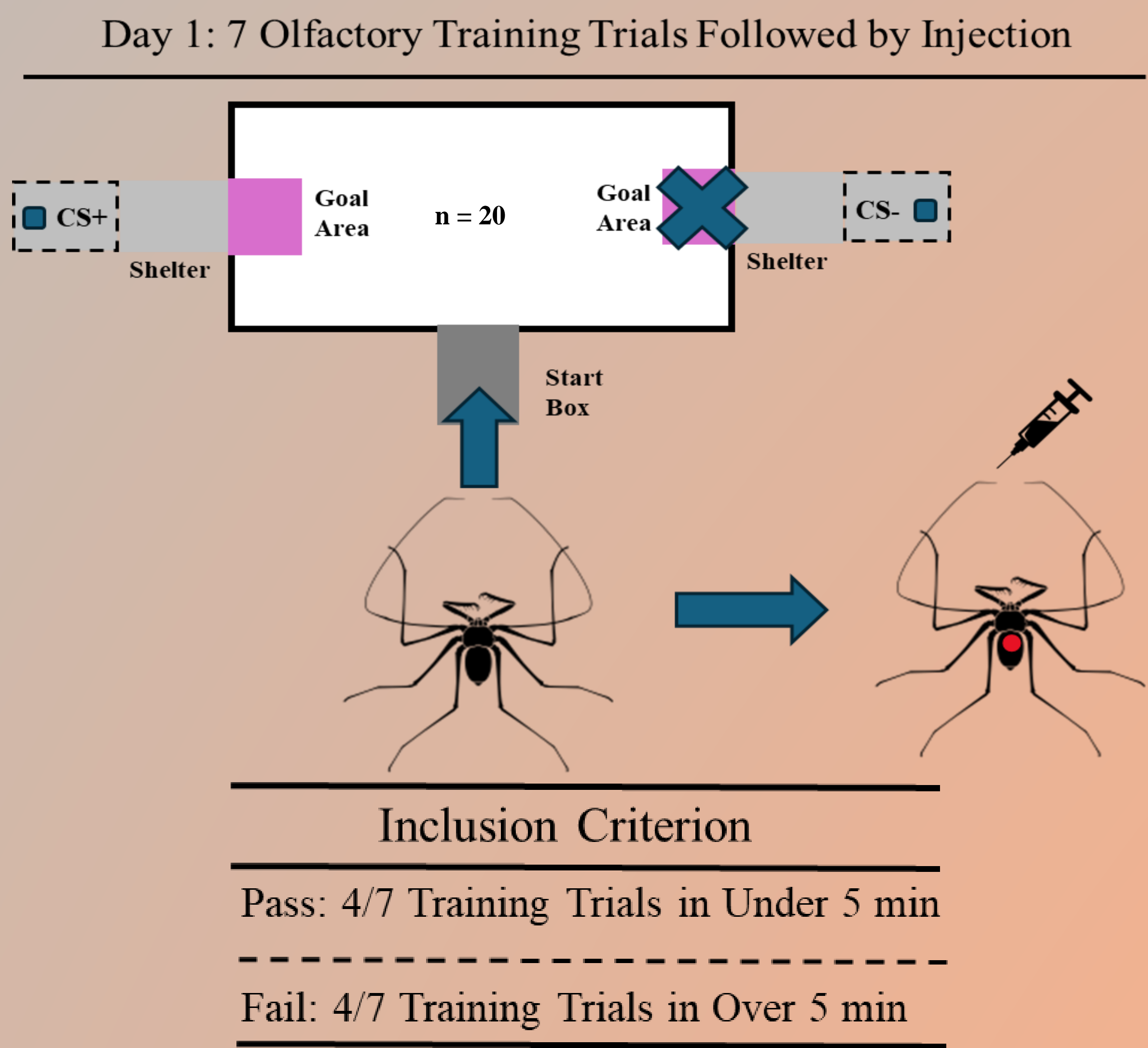
Whip spiders (*Phrynos marginemaculatus*) are arachnids that navigate primarily by their unusually keen olfactory abilities. While bioamine function in whip spider remains completely unexplored, comparative anatomy indicates that their olfactory memory likely depends on bioamine, such as serotonin and dopamine, signaling.

## Hypothesis

- If serotonin activity is pharmacologically disrupted within the whip spider brain, their performance in an associative olfactory learning task will be significantly impaired.
- Serotonin is present in a region relevant to olfactory information within the whip spider brain.



## Behavioral Methods

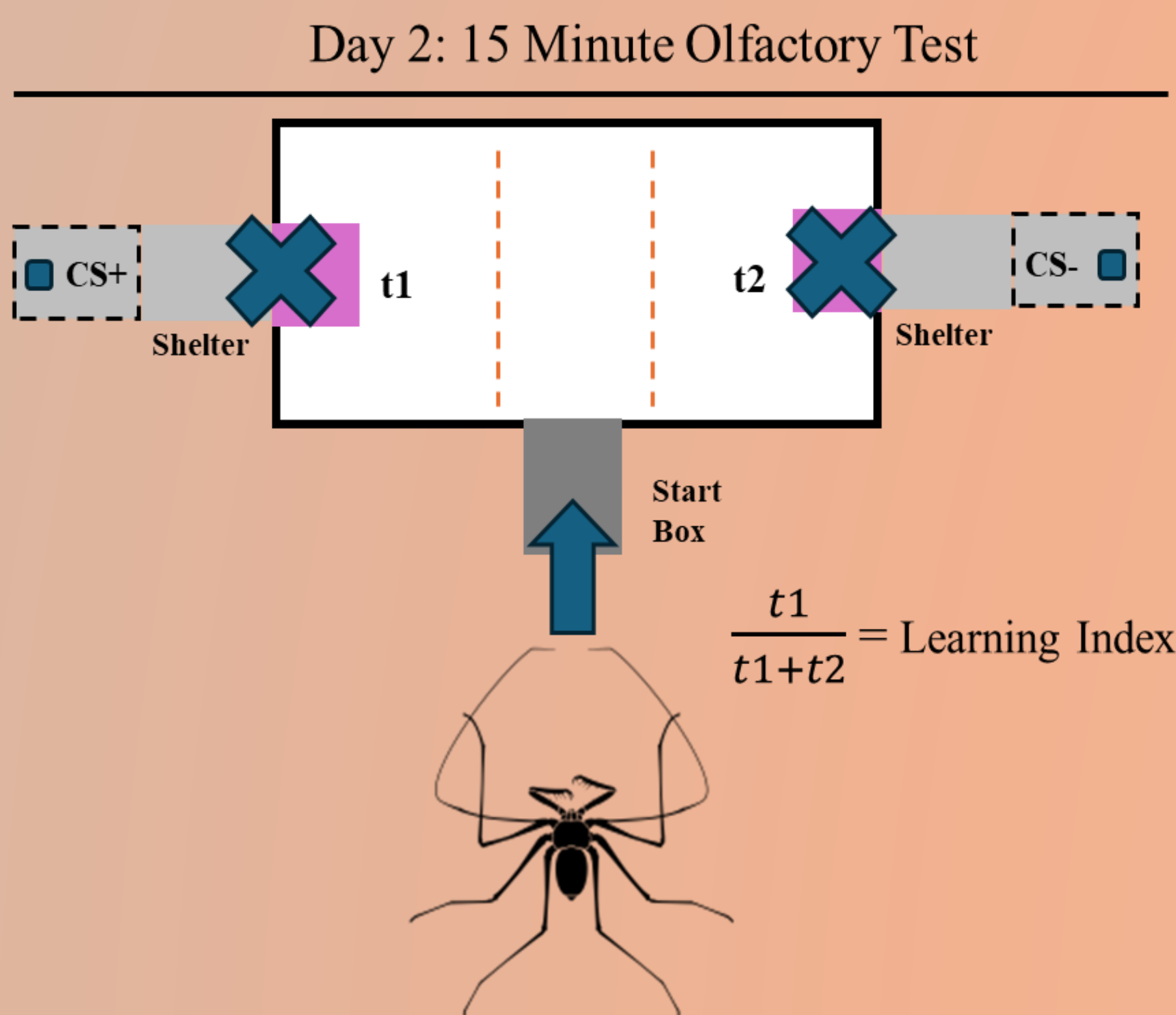


Shelters were pseudorandomly switched between each trial.

The control was 0.9% physiological saline.

The serotonin antagonist used was methiothepin mesylate 7 mM.

Light avoidance was the motivating factor.



## Results

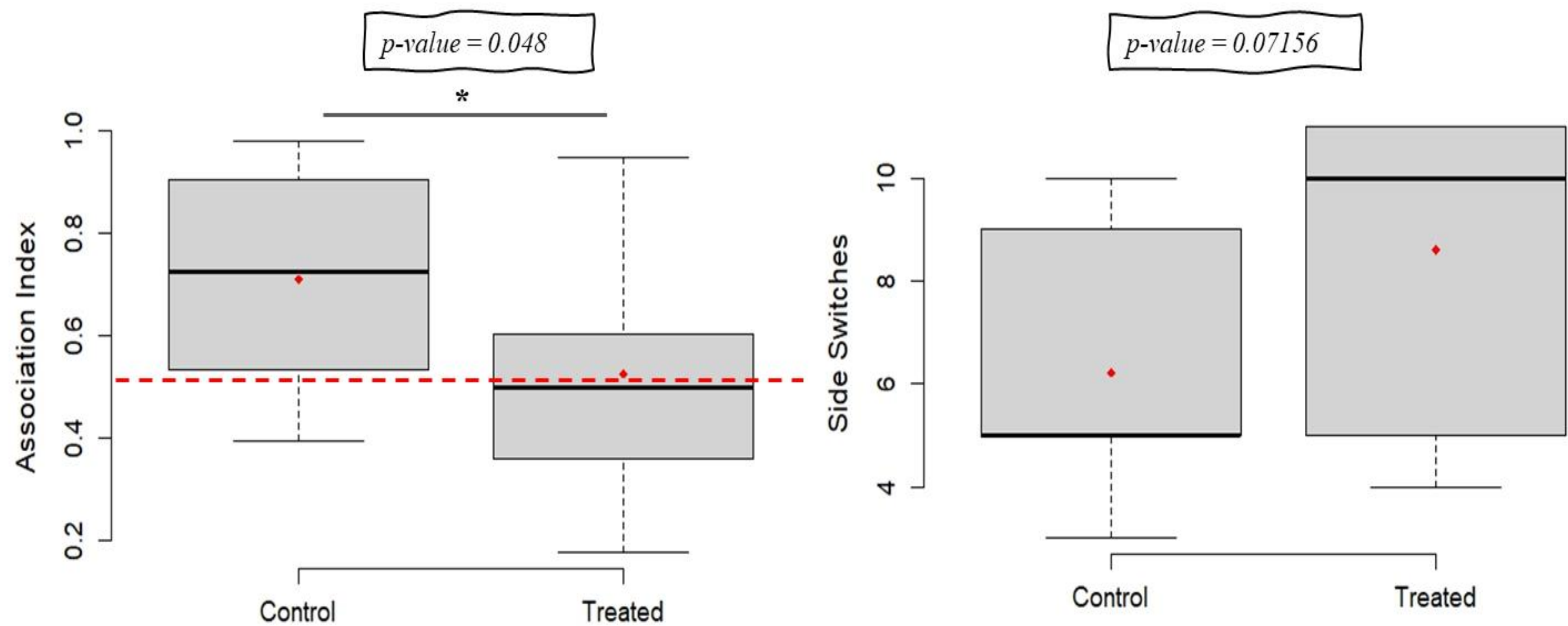


Fig. 1: Treated subjects scored significantly different on test day compared to controls (two-tailed t-test, \*p-value = 0.048). No differences in locomotion were found between groups (Wilcoxon rank sum test, p > 0.05). Control subjects scored above chance on test day (one sample t-test, \*\*p = 0.006).

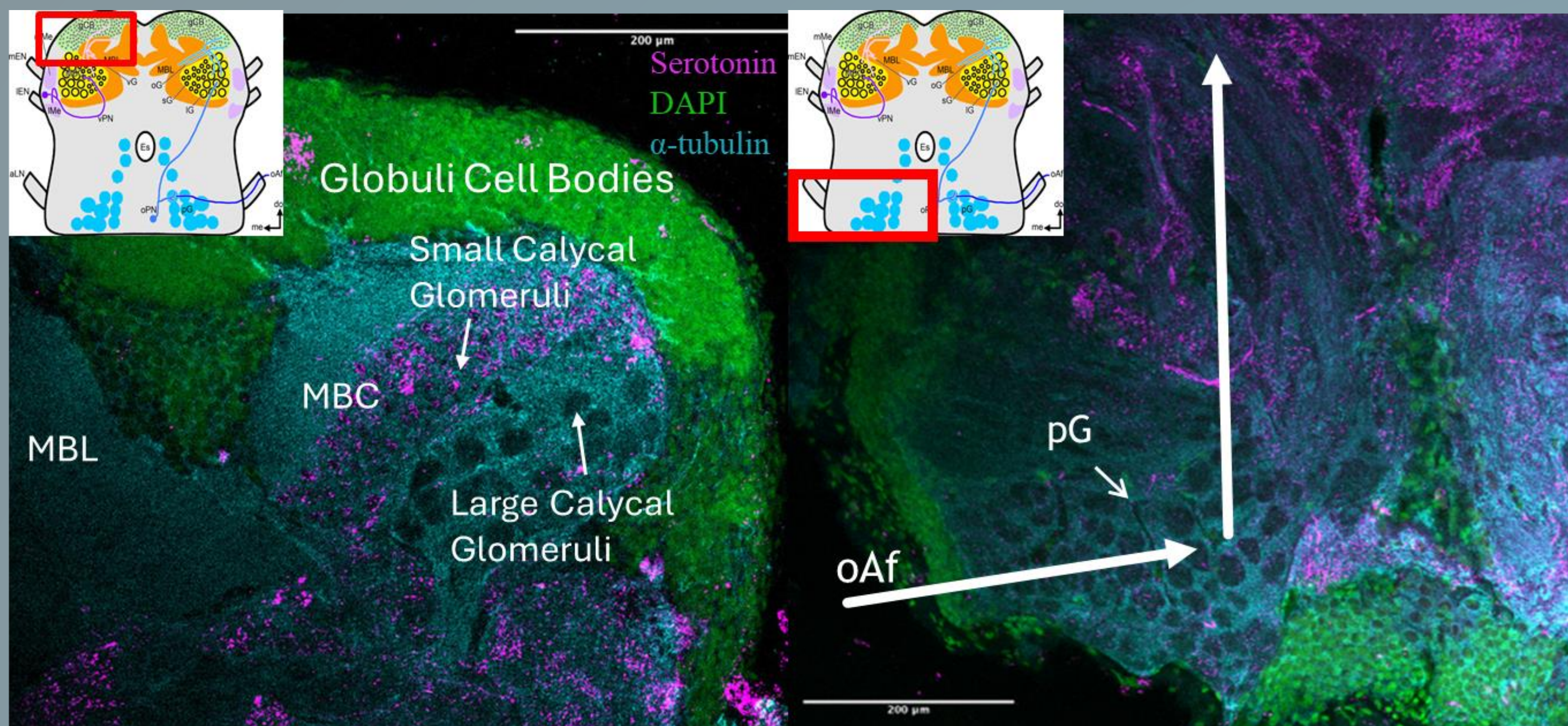


Fig. 2: Serotonin is found throughout the whip spider brain, including the primary glomeruli (pG) and calyx (MBC). MBL = mushroom body lobe, oAf = sensilla olfactory afferents.

## Conclusion

These results indicate that the serotonin antagonist methiothepin mesylate impairs memory consolidation without impairing locomotion at 7 mM.